ORIGINAL ARTICLE

IMPACT OF THE COVID-19 PANDEMIC ON QUALITY OF LIFE OF HEALTH CARE WORKERS IN PAKISTAN

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Background: Health care workers (HCWs) working on frontlines in COVID-19 pandemic are highly vulnerable to deteriorating physical and mental health. The quality of life of health care workers plays an important role in their skilful delivery of work. Our study assesses their quality of life (QOL) during COVID-19 pandemic so that appropriate measures can be taken to improve their well-being. **Methods:** This was an online cross-sectional survey among healthcare workers of COVID-19 designated government hospitals in districts Abbottabad, Manshera and Haripur, Khyber Pakhtunkhwa, Pakistan from 23rdJune till 25thJuly, 2020. QOL was assessed using validated WHO QOL BREF. Univariate and multivariate linear regression were used to assess the factors associated with QOL among HCWs. **Results:** A total of 362 HCWs participated in the study. The mean scores of physical, psychological, social relationships, environmental domains were 60.7 (±17.40), 59.70 (±17.30), 67.90 (±17.90), and 58.20 (±18.40) respectively. Hospital where the respondents were working was the consistent predictor of QOL scores in all four domains with generally lower scores associated with other hospitals compared to Ayub Medical Hospital. Years of experience were positively associated with psychological, social relationship and environmental domains. Designation was associated with social relationship domain only. The scores were lower for trainee medical officers (adjusted β -11.5) and higher for house officer (adjusted β 10.0) and nurses and technicians (adjusted β 7.0) compared to heads of departments and specialists. **Conclusions:** Quality of life of health care workers has been affected negatively in hospitals of Abbottabad, Pakistan during COVID-19. This calls for hospital administrations, policymakers and the government to take necessary actions to protect the wellbeing of the backbone of the healthcare system.

Keywords: COVID-19; Health care workers; Predictors; Quality of life; Pakistan

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INTRODUCTION

The world has suffered from a number of deadly pandemics which ravaged humanity. The black death, Spanish flu, MERS, SARS, Ebola are some of the deadliest which made many ponder human extinction.[1] A novel corona virus (Corona Virus-19) was identified in December 2019 as a cluster of cases from China and then then declared it as a pandemic.[2] Corona Virus has caused disease in 31,490,311people including 969,362 deaths around the globe as of September 21, 2020.[3] The first case in Pakistan appeared in Karachi on February 26, 2020.[4]

In order to fight this war the availability of efficient and healthy healthcare workers is of paramount importance.[5] The quality of life (QOL) of healthcare providers plays a pivotal role in their skilful delivery of work.[5] QOL is multidimensional and envisages mental, physical, social and material wellbeing.[6] Those working with critical patients have a low quality of life than those taking care of non-critical patients.[7] Burnout is most common in healthcare profession with specialties on frontline at greatest risk. Due to highly contagious nature of COVID-19, the health care workers who are working on frontlines are cut off from their friends and families, working alone tirelessly.[5] This makes them highly vulnerable to deteriorating physical and mental health.[8] In some countries, moral support by community, free food, music therapies, accommodation by healthcare facilities, counselling, allotment of resources and acknowledgment by society have a positive impact on health providers.[9]

This study aims to assess quality of life of healthcare professionals during this difficult

time to ensure their maximum efficacy as their burnout could lead to devastating outcomes. This research is one of its kinds as no such research has been conducted before on health care personnel in Pakistan who are facing a daily rise in COVID patient load and shortage of medical equipment. The results of this study will provide evidence on impact on QoL of HCWs during COVID-19. This will help community, district health sector and policy makers to facilitate healthcare workers to improve their quality of life.

MATERIAL AND METHODS

The researchers used a cross-sectional survey to collect data from healthcare providers working in government hospitals designated for COVID-19 patients in in three major districts; Abbottabad, Manshera and Haripur of Khyber Pakhtunkhwa province, Pakistan.

Ayub Teaching Hospital, Abbottabad provides healthcare facilities to COVID 19 patients and also serve as a quarantine center. It is a 1465 bedded and only tertiary care hospital in province after Peshawar and largest in Northern Pakistan. It is a center for undergraduate and postgraduate studies with advanced diagnostic and therapeutic facilities.[10]

Benazir Bhutto Shaheed Hospital also known as District Headquarter Hospital (DHQ) Abbottabad is designated for serving as quarantine center and isolation ward. The DHQ hospital Abbottabad consists of the General Hospital and Women and Children Hospital. It has total 380 beds, 116 Doctors, and 140 Nurses with very basic equipment and provides basic and specialist health facility.[1] King Abdullah Teaching Hospital, Mansehra (DHQ Mansehra) is an 'A' category, 285 bedded well-equipped hospitals with state of the art facility where patients of all diseases are treated[12]. In this hospital 110 Doctors and 106 Nurses are performing their duties.[11] The DHQ Hospital Haripur is a category-B hospital in the Haripur district. The number of beds is 210 officially, but the actual number is about 300. The total staff includes 101 Doctors and 129 Nurses.[11]

Data was collected from 23rdJune and 25thJuly, 2020. We used convenience sampling strategy and used all possible means to contact the healthcare providers working in these hospitals. Data was collected through a web-based self-administered questionnaire formulated on Google form and printed questionnaires were circulated in the hospitals by the data collectors. Access link to the survey was sent to the healthcare providers by using personal contacts to reach out HCWs through email and social media platforms like Facebook, WhatsApp, and Instagram. Face to face interviews were also conducted in some cases where respondents were not active in social media. Participants were explained about the objectives of the study and informed consent was taken before the start of the study. The willingness of the participants and choice of language was taken into consideration before collecting the data.

Section I was based on demographic information. Variables included were age, gender, type of hospital, designation of the HCWs, department of hospital, education status, marital status, years of experience, duty hours per day and practice in private clinics. Section II included questions based on WHOQOL-BREF in English and Urdu language.

The WHOQOL-BREF is a well-known instrument for evaluating QOL status in general population and different communities.[13] The World Health Organization Quality of Life Group defines QOL as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.[14,15] It is the brief form of WHOQOL-100 which is based on 100 questions in multiple dimensions, different languages, and developed in more than 15 international centers.[16] The WHOQOL-BREF contains one item from each of the 24 facets of WHOQOL-100 and two additional items intended as indicators of overall QOL.[17] It is has four domains with total 26 items based on physical health (7 questions), psychological health (6 questions), social relationships (3 questions), and environmental health (8 questions), last two items are about general health and overall quality of life. The scoring system is based on 5-point Likert scale where 1 represents very dissatisfied/very poor and 5 represents very satisfied. The score is then transformed into a linear scale between 0–100 scales, where 0 being the minimum satisfactory and 100 being the maximum favourite.[18]

Data was downloaded as Microsoft Excel sheet and then imported to IBM SPSS for Windows, version 16 (IBM Corp., Armonk, USA) for analysis. Categorical variables such as age, years of experience, duty hours per week, were reported as mean and standard deviations, while gender, working hospital, designation, department within the hospital, education, marital status, and practice at a private clinic were expressed as frequencies and percentages. One way ANOVA

and t-test were used to compare the differences in QoL scores between different categories based on socio-demographic and professional characteristics. Univariate and multivariate linear regression were used to assess the factors associated with QoL among HCWs. Separate analysis was done for all four domains of WHOQOL-BREF. *p*-value <0.05 was considered statistically significant.

The ethical approval of the study was sought from Ethics Review Committee of Ayub Medical College, Abbottabad (Ref No: ERC-AMC.165.2020). The first page of the online form described the purpose of the study and consent was taken on that page from all the participants.

RESULTS

The socio-demographic variables are given in table-1. Among our study population 56.4% were female and 52.5% were single. The mean age of the population was 30.7 (SD: 7.84) years ranging from 21 to 58 years. The major proportion of respondents was from Ayub medical college 43.6% and the least were from DHQ Haripur 17.4%. In our study population, greater number of respondents was House officers 31% and nursing/technicians 26.5%. MBBS/BDS 46.4% was the leading educational degree followed by 25.7% with a nursing bachelor/diploma. About one third of our respondents 32% worked at Corona ward and triage followed by 28.2% in Medicine/Paeds. A majority, 74% had factors with domains of quality of life through the univariate and adjusted analysis. The results obtained from univariate analysis indicated that in physical health domain, age from 26–35 years was negatively associated with QOL scores and it was associated with 2.40-unit reduction when compared with 20–25 years (p<0.05). Compared to Ayub teaching hospital, DHQ Haripur had 14.60 units lower scores while DHQ Abbottabad Hospital had 5.78-unit higher score (p<0.05). Clinical experience from 1 to 5 years was significantly negatively associated with physical QOL scores and there was 3.91 units reduction when compared with <1 year.

In Psychological health domain, compared to Ayub teaching hospital, DHQ Haripur was associated with 11.0 units lower score while DHQ Abbottabad Hospital had 5.36-unit higher score (p<0.05), years of clinical experience from 1 to 5 years was positively associated with psychological QOL scores and it had 3.91 unitshigher when compared with <1 year and clinical experience more than five years was significantly negatively associated.

In Social relationship health domain, Compared to Ayub teaching hospital, DHQ Haripur had 9.51 units lower scores (p<0.05), being house officer was significantly negatively associated with social relationship QOL scores and there was 4.05-unit reduction when compared with Heads of department (HoD) and Specialist.

In Environmental health domain, compared to Ayub teaching hospital, DHQ Haripur had significant reduction of about 7.90 points (p<0.05), years of clinical experience from >5 years was significantly associated with environmental health domain QOL scores and there was an increase of 5.50 unit when compared with < 1 year years of experience and clinical practice more than 5 years and having no clinical practice was negatively associated as there was 7.27 unit reduction in Environmental health domain of QOL (p<0.05).

The results from adjusted analysis indicated that physical health domain was only negatively associated with DHQ hospital Manshera and Haripur when we compared it with Ayub Teaching Hospital. Psychological health domain showed a significant negative association with age more than 45 years of age, DHQ Manshera, DHQ Haripur hospital and years of experience more than 5 years. Social relationship was negatively associated with DHQ Haripur Hospital, Training medical officer and House officers. Furthermore, Nursing and technicians and years of Experience from 1 to 5 years and more than 5 years showed significant positive association in this domain. Finally, Environmental health domain was associated with DHQ Haripur, DHQ Abbottabad Hospital, years of experience more than 5 years and clinical practice.

Table-1: Socio-demographic characteristics and QOL scores among health care workers, Pakistan (n=362)

Variable		Domains of Quality of life (mean ± SD)			
	Frequency (%)	Physical Mean±SD	Psychological Mean ±SD	Relationship Mean±SD	Environmental Mean±SD
Respondent Sex					
Male	158 (43.6%)	60.84±15.70	60.23±16.04	67.77±17.01	57.25±18.66
Female	204 (56.4%)	60.58±18.71	59.21±18.14	68.01±18.56	58.90±18.22
***p*-value (t test)**		0.879	0.572	0.898	0.407
Respondent Age					
20–25 years	112 (30.9%)	64.73±17.10	61.45±15.42	67.63±16.58	58.95±18.51
26–35	176 (48.6%)	58.57±17.64	58.52±17.21	67.90±18.70	56.80±18.52
36–45	51 (14.1%)	59.96±16.96	59.10±19.90	67.81±19.14	58.63±18.53
>45	23 (6.4%)	61.20±15.92	60.87±20.20	69.56±15.61	63.85±16.40
***p*-value (ANOVA)**		**0.027**	0.543	0.974	0.334
Hospital Name					
Ayub Medical Hospital	158 (43.6%)	64.20±16.0	62.05±15.98	69.62±16.21	60.40±17.84
DHQ.Manshera	71 (19.6%)	65.34±17.20	63.97±17.76	70.42±17.35	60.65±17.20
DHQ. Haripur	63(17.4%)	59.75±16.42	58.66±17.02	69.31±17.31	56.84±16.68
DHQ.Abbottabad	70 (19.3%)	48.92±16.52	50.77±16.91	60.23±20.61	51.83±20.94
***p*-value (ANOVA)**		**0.027**	0.543	0.974	0.334
Marital Status					
Single	190 (52.5%)	61.44±18.34	59.54±17.30	67.20±18.23	57.53±19.96
Ever Married, Divorced, Widow	172 (47.5%)	59.86±16.37	59.78±17.24	68.70±17.50	58.90±16.54
***p*-value (t test)**		0.386	0.892	0.423	0.482
Designation					
HoD& Specialist	31 (8.6%)	60.71±15.11	60.00±15.10	71.78±10.70	62.90±15.47
Medical Officer	54 (14.9%)	58.90±18.20	57.56±17.30	68.05±17.11	55.72±16.60
Training medical officer	67 (18.5%)	60.40±15.80	57.97±19.00	66.42±19.13	58.96±19.70
House officer	114 (31.5%)	62.90±14.60	59.80±16.35	65.13±19.53	56.38±20.42
Nurses & Technicians	96 (26.5%)	60.40±14.80	61.76±17.78	70.92±16.80	59.60±16.61
***p*-value (ANOVA)**		0.340	0.579	0.116	0.312
Education					
MBBS & BDS	168 (46.4%)	60.82±18.10	59.37±16.70	66.71±18.80	57.44±19.50
FCPS & PhD	30 (8.3%)	61.90±15.30	62.63±12.80	71.66±11.10	64.20±13.90
Nursing, Bachelor & Diploma	93 (25.7%)	60.67±16.50	60.84±18.20	69.90±16.90	57.50±16.20
Post Graduate Training	71 (19.6%)	59.90±18.00	57.51±18.80	66.54±19.10	58.30±19.90
***p*-value (ANOVA)**		0.961	0.482	0.305	0.312
Department					
Emergency, CCU & ICU	56 (15.5%)	59.70±18.10	59.60±19.50	66.70±21.30	58.10±19.40
COVID-19 Triage and Ward	116 (32%)	60.60±15.30	58.62±16.70	69.75±16.00	57.00±18.00
Medicine &Peads	102 (28.2%)	63.20± 16.50	62.30±16.40	68.70± 17.50	60.80±17.50
Surgery, ENT, Eye, Gyne& others	88 (24.3%)	58.60±18.00	58.00±17.51	65.30±18.22	56.82±19.30
***p*-value (ANOVA)**		0.315	0.308	0.318	0.394
Experience in Years					
< 1 year	100 (27.6%)	62.40±17.80	59.00 ± 16.90	63.40±18.10	55.70±20.20
1 to 5 year	163 (45.0%)	58.50±18.22	57.50 ± 18.00	68.40±18.90	57.30±18.60
> 5 Years	99 (27.3%)	62.60±15.30	64.00 ± 15.60	71.70±14.80	62.20±15.50
***p*-value (ANOVA)**		0.104	**0.012**	**0.004**	**0.033**
Duty Hours					
Up to 8 Hours	268 (74.0%)	60.60±16.90	59.80±17.30	68.62±17.70	58.42 ± 18.70
> 8 Hours	94 (26.0%)	61.00±18.90	59.30±17.20	65.90±18.30	57.50 ± 17.50
***p*-value (t test)**		0.843	0.842	0.208	0.661
Clinic					
Yes	53(14.6%)	58.55±16.30	60.10±15.50	67.80±13.50	64.40±14.70
No	309(85.4%)	61.00±17.40	59.60±17.60	67.90±18.50	57.10±18.78
***p*-value (t test)**		0.312	0.810	0.938	**0.002**

DHQ: District Head Quarter hospital. HoD: Head of department. FCPS: Fellow of College of Physicians and Surgeons, Pakistan. CCU: Cardiac Care Unit. ICU: Intensive care unit

Table-2: Factors associated with Physical domain of QOL among health care workers, Pakistan

Characteristics	Univariate analyses			Multivariate analyses		
	Beta coefficient	95% CI	*p* - value	Beta coefficient	95% CI	*p* - value
Respondent Sex						
Male	**R**			**R**		
Female	-0.27	-3.91- 3.36	0.882	--	--	--
Respondent Age						
20- 25 years	R			R		
26- 35	-4.20	-7.70 - -0.60	**0.023**	-4.71	-9.90 - 0.50	0.076
36-45	-2.01	3.20 - -7.20	0.445	-6.70	-14.50 - 1.20	0.095
>45	0.52	-6.90 - 7.90	0.890	-4.00	-13.90 - 5.80	0.422
Hospital Name						
Ayub Medical Hospital	**R**			R		
DHQ.Manshera	-1.14	-5.90 - 3.61	0.637	-6.30	-11.90 - -0.50	**0.032**
DHQ. Haripur	-14.60	-18.90– -10.30	**0.001**	-15.20	-20.80– -09.50	**0.001**
DHQ.Abbottabad	5.78	1.27 – 10.28	**0.012**	0.001	-5.70 – 5.70	1.000
Marital Status						
Single	**R**			**R**		
Ever Married, Divorced, Widow	-1.58	-5.19 – 2.02	0.388	--	--	--
Designation						
HoD& Specialist	**R**			**R**		
Medical Officer	-4.48	9.52– 0.55	0.081	-7.00	-14.80– 0.70	0.076
Training medical officer	3.15	-1.08– 7.40	0.140	-6.90	-15.00– 1.20	0.097
House officer	3.27	-0.60– 7.10	0.097	4.30	-5.30– 13.80	0.382
Nurses & Technicians	-0.429	-4.51 – 3.60	0.837	-0.20	-6.20 – 5.90	0.959
Education						
MBBS & BDS	**R**			**R**		
FCPS & PhD	1.32	-5.22– 7.862	0.692	--	--	--
Nursing, Bachelor & Diploma	-0.64	-4.26– 3.00	0.728	--	--	--
Post Graduate Training	-0.97	-5.50– 3.60	0.673	--	--	--
Department						
COVID-19 Triage and Ward	**R**			**R**		
Emergency, CCU & ICU	-1.18	-6.20 – 3.80	0.641	2.50	-3.00 – 8.00	0.369
Medicine &Peads	3.44	-0.60– 7.40	0.091	1.42	-3.10– 6.00	0.537
Surgery, ENT, Eye, Gyne& others	-2.81	-7.00– 1.40	0.188	-2.53	-7.40– 2.30	0.304
Experience in Years						
< 1 year	**R**			**R**		
1 to 5 year	-3.91	-7.51– 0.30	**0.034**	4.85	-3.90– 13.60	0.278
> 5 Years	2.56	-1.48– 6.60	0.213	9.26	-1.10– 19.60	0.080
Duty Hours						
Up to 8 Hours	**R**			**R**		
> 8 Hours	0.44	-3.70– 4.60	0.835	--	--	--
Clinic Practice						
Yes	**R**			**R**		
No	2.50	-2.60 – 7.60	0.335	--	--	--

CI: Confidence interval. R: Reference. DHQ: District Head Quarter hospital. HoD: Head of department. FCPS: Fellow of College of Physicians and Surgeons, Pakistan. CCU: Cardiac Care Unit. ICU: Intensive care unit

Table-3: Factors associated with psychological domain of QOL among health care workers, Pakistan

Characteristics	Univariate analyses			Multivariate analyses		
	Beta coefficient	95% CI	*p* - value	Beta coefficient	95% CI	p - value
Respondent Sex						
Male	**R**			**R**		
Female	-1.02	-4.60- 2.60	0.578	--	--	--
Respondent Age						
20- 25 years	**R**			**R**		
26- 35	2.20	-1.40 - 5.80	0.225	-3.05	-8.10 - 2.00	0.085
36-45	0.68	-4.50 - 5.80	0.793	-6.74	-14.40 - 0.90	0.193
>45	-1.30	-8.60 - 6.00	0.728	-6.42	-16.10 - -3.30	**0.003**
Hospital Name						
Ayub Medical Hospital	**R**			**R**		
DHQ.Manshera	-1.20	-5.90 - 3.50	0.616	-8.40	-13.90 - -3.00	**0.003**
DHQ. Haripur	-11.00	-15.40– -6.60	**0.001**	-13.60	-19.10– -8.00	**0.001**
DHQ. Abbottabad	5.36	0.90 – 9.90	**0.019**	-3.30	-8.90 – 2.40	0.259
Marital Status						
Single	**R**			**R**		
Ever Married, Divorced, Widow	0.24	-3.30 – 3.80	0.892	--	--	--
Designation						
HoD& Specialist	**R**			**R**		
Medical Officer	2.46	-2.54 – 7.50	0.334	--	--	--
Training medical officer	-1.60	-5.80 – 2.60	0.455	--	--	--
House officer	-0.20	-4.00 –3.60	0.918	--	--	--
Nurses & Technicians	-2.86	-6.90 – 1.20	0.164	--	--	--
Education						
MBBS & BDS	**R**			**R**		
FCPS & PhD	-3.25	-9.70 – 3.22	0.324	5.13	-2.00 – 12.30	0.159
Nursing, Bachelor & Diploma	0.46	-3.10 – 4.00	0.797	-0.17	-5.20 – 4.90	0.945
Post Graduate Training	2.66	-1.80 – 7.16	0.244	-4.18	-10.00 – 1.70	0.163
Department						
COVID-19 Triage and Ward	**R**			**R**		
Emergency, CCU & ICU	0.07	-4.90 – 5.00	0.978	3.22	-2.20 – 8.30	0.243
Medicine &Peads	-3.67	-7.60 – 0.30	0.069	3.10	-1.50 – 7.50	0.185
Surgery, ENT, Eye, Gyne& others	2.20	-2.00 – 6.30	0.302	-0.42	-5.20 – 4.30	0.861
Experience in Years						
< 1 year	**R**			**R**		
1 to 5 year	3.98	0.42 – 7.60	**0.029**	4.30	-1.30 – 10.00	0.135
> 5 Years	-5.88	-9.80 – -1.92	**0.004**	12.20	5.00 – 19.50	**0.001**
Duty Hours						
Up to 8 Hours	**R**			**R**		
> 8 Hours	0.41	-3.70 – 4.50	0.843	--	--	--
Clinic Practice						
Yes	**R**			**R**		
No	-0.56	-5.60 – 4.50	0.825	-4.38	-10.60 – 1.90	0.168

CI: Confidence interval. R: Reference. DHQ: District Head Quarter hospital. HoD: Head of department. FCPS: Fellow of College of Physicians and Surgeons, Pakistan. CCU: Cardiac Care Unit. ICU: Intensive care unit

Table-4: Factors associated with Social Relationship domain of QOL among health care workers, Pakistan

Characteristics	Univariate analyses			Multivariate analyses		
	Beta coefficient	95% CI	*p* - value	Beta coefficient	95% CI	p - value
Respondent Sex						
Male	**R**			**R**		
Female	0.24	-3.50- 4.00	0.899	--	--	--
Respondent Age						
20- 25 years	**R**			**R**		
26- 35	-0.02	-3.72 - 3.70	0.990	--	--	--
36-45	-0.11	-5.40 - 5.20	0.966	--	--	--
>45	1.76	-5.80 - 9.30	0.647	--	--	--
Hospital Name						
Ayub Medical Hospital	**R**			**R**		
DHQ.Manshera	-1.69	-3.20 - 6.60	0.494	-5.70	-11.60 – 0.60	0.052
DHQ. Haripur	-9.51	-14.10– -4.90	**0.001**	-15.50	-21.00– -9.90	**0.001**
DHQ.Abbottabad	3.12	-1.50 – 7.80	0.187	-3.80	-9.40 – 1.90	0.193
Marital Status						
Single	**R**			**R**		
Ever Married, Divorced, Widow	1.50	-2.20 – 5.20	0.424	--	--	--
Designation						
HOD & Specialist	**R**			**R**		
Medical Officer	0.17	-5.00 – 5.40	0.948	-4.64	-12.30 – 3.00	0.234
Training medical officer	-1.96	-6.30 – 2.40	0.377	-11.53	-19.90 – 3.20	**0.007**
House officer	-4.05	-8.00 – -0.09	**0.045**	10.00	0.80 –19.40	**0.034**
Nurses & Technicians	4.10	-0.07 – 8.30	0.054	7.04	0.80 – 13.30	**0.028**
Education						
MBBS & BDS	**R**			**R**		
FCPS & PhD	4.10	-2.60 – 10.80	0.230	--	--	--
Nursing, Bachelor & Diploma	0.97	-2.70 – 4.70	0.605	---	--	--
Post Graduate Training	-1.69	-6.40 – 3.00	0.475	--	--	--
Department						
COVID-19 Triage and Ward	**R**			**R**		
Emergency, CCU & ICU	-1.47	-6.60 – 3.60	0.572	--	--	--
Medicine &Peads	1.11	-3.00 – 5.22	0.595	--	---	--
Surgery, ENT, Eye, Gyne& others	-3.39	-7.70 – 0.90	0.122	--	--	--
Experience in Years						
< 1 year	**R**			**R**		
1 to 5 year	0.80	-2.90 – 4.50	0.670	12.50	3.50 – 21.40	**0.006**
> 5 Years	5.20	1.12 – 9.40	**0.013**	13.75	3.60 – 23.90	**0.008**
Duty Hours						
Up to 8 Hours	**R**			**R**		
> 8 Hours	-2.75	-7.00 – 1.50	0.199	-2.90	-7.20 – 1.40	0.179
Clinic Practice						
Yes	**R**			**R**		
No	0.16	-5.06 – 5.40	0.950	--	--	--

CI: Confidence interval. R: Reference. DHQ: District Head Quarter hospital. HoD: Head of department. FCPS: Fellow of College of Physicians and Surgeons, Pakistan. CCU: Cardiac Care Unit. ICU: Intensive care unit.

Table-5: Factors associated with Environmental health domain of QOL among health care workers, Pakistan

Characteristics	Univariate analyses			Multivariate analyses		
	Beta coefficient	95% CI	*p* - value	Beta coefficient	95% CI	p - value
Respondent Sex						
Male	**R**			**R**		
Female	1.60	-2.20- 5.50	0.405	--	--	--
Respondent Age						
20- 25 years	**R**			**R**		
26- 35	-2.67	-6.50 - 1.10	0.167	-4.50	-10.00 - 1.10	0.117
36-45	0.54	-4.90 - 6.00	0.846	-7.90	-16.40 - 0.60	0.070
>45	6.10	-1.70 - 13.90	0.126	-4.60	-15.20 - 6.00	0.399
Hospital Name						
Ayub Medical Hospital	**R**			**R**		
DHQ.Manshera	-1.60	-6.60 - 3.40	0.529	-7.07	-13.20 – -0.94	**0.024**
DHQ. Haripur	-7.90	-12.60– -3.10	**0.001**	-12.54	-18.70– -6.30	**0.001**
DHQ.Abbottabad	3.10	-1.70 – 7.90	0.207	-3.15	-9.30 – 3.00	0.311
Marital Status						
Single	**R**			**R**		
Ever Married, Divorced, Widow	0.05	-2.46 – 5.20	0.486	--	--	--
Designation						
HoD& Specialist	**R**			**R**		
Medical Officer	-2.90	-8.20 – 2.50	0.290	-8.50	-19.80 – 2.80	0.139
Training medical officer	-0.20	-4.70 – 4.30	0.922	3.96	-11.80 – 19.80	0.622
House officer	-2.60	-6.70 – 1.50	0.211	-8.51	-27.30 – 10.30	0.373
Nurses & Technicians	1.94	-2.40 – 6.30	0.376	-0.44	-18.30 – 17.30	0.961
Education						
MBBS & BDS	**R**			**R**		
FCPS & PhD	6.50	-3.50 – 13.40	0.063	-1.60	-12.00 – 8.80	0.763
Nursing, Bachelor & Diploma	-0.62	-4.50 – 3.20	0.747	-8.80	-17.80 – 0.20	0.056
Post Graduate Training	0.12	-4.70 – 4.90	0.960	-1.00	-18.00 – 16.00	0.907
Department						
COVID-19 Triage and Ward	**R**			**R**		
Emergency, CCU & ICU	-0.03	-5.30 – 5.20	0.990	3.75	-2.20 – 9.70	0.218
Medicine &Peads	3.60	-0.60 – 7.80	0.095	3.30	-1.60 – 8.20	0.188
Surgery, ENT, Eye, Gyne& others	-1.80	-6.20 – 2.60	0.428	-0.18	-5.00 – 5.40	0.946
Experience in Years						
< 1 year	**R**			**R**		
1 to 5 year	-1.65	-5.50 – 2.20	0.396	6.36	-3.00 – 15.80	0.185
> 5 Years	5.50	1.20 – 9.70	**0.011**	12.42	0.20 – 23.60	**0.029**
Duty Hours						
Up to 8 Hours	**R**			**R**		
> 8 Hours	-0.93	-5.30 – 3.40	0.671	--	--	--
Clinic Practice						
Yes	**R**			**R**		
No	-7.27	-12.61 – -1.90	**0.008**	-10.78	-17.40– -4.20	**0.001**

CI: Confidence interval. R: Reference. DHQ: District Head Quarter hospital. HoD: Head of department. FCPS: Fellow of College of Physicians and Surgeons, Pakistan. CCU: Cardiac Care Unit. ICU: Intensive care unit

DISCUSSION

Health care workers experience patients in trauma, life threatening conditions and losses of life in their routine practice. However, COVID-19 has brought unprecedented circumstances where HCWs are experiencing an increased morbidity and mortality, shortage of personal protective equipment, availability to of beds and health care facilities for critically ill patients and risk of infection to themselves and their friends and family members.[8,19] All these factors can severely affect the mental health and quality of life of health care workers who are the backbone in the response against COVID-19 pandemic. In this s study we assessed the quality life of health care workers during COVID-19 pandemic in Pakistan using WHO QoL BREF questionnaire.

We found that mean (±SD) scores were physical 60.7 (±17.4), psychological 59.6 (±17.3), relationship 67.9 (±17.9) and environmental 58.2 (±18.4). These values are lower than 65.0 (±15.2), 67.4 (±15.0), 72.0 (±16.5) and 55.5 (±15.0) for physical, psychological, relation and environmental domains respectively reported for general population in Khyber Pakhtunkhwa Pakistan.[18] A previous study among health care workers from Iran reported higher score in physical domain (70.5) while lower scores in relationship domain (63.5), while psychological and environmental domain scores were comparable to our estimates.[20] During the COVID-19 pandemic a number of studies have been conducted to assess the mental health of health care workers and found that COVID-19 has negatively affected the mental health of the health care workers.[21–23] There is high prevalence of sleep disorder, stress, anxiety and depression. This indicates the quality of life of health care workers during COVID-19 has been affected negatively and there is need for interventions to improve their quality of life and productivity.

In this study we found that hospital type was significant predictor of QoL among health care workers across all four domains. Compared to Ayub Medical College Hospital, other hospital was negatively associated with one of more domains of QoL. This could be due to fact that being a teaching hospital, Ayub Medical College Hospital may have better human resource in terms of number and skills, better infection control and protective measures for the staff. We did not find a significant association of QoL with gender. This is in contrast to the result from general population of Pakistan where male had better scored in physical, psychological domain than female.[18] A study among HCW in Iran also found no significant difference in the QoL scores with respect to gender except for psychological domain.[20] This could be due to fact that female HCW are financially strong and independent and therefore do not differ from their male counterparts as employment status and financial wellness have positive association with QoL scores.[24,25]

We did not find a significant association of designation with QoL scores except for relationship domain where being training medical officer was associated with lower scores compared to specialist and heads of departments. We also did not find any association of work department including COVID-19 ward. This finding is in contrast to a study from Serbia, where workers in the COVID-19 wards were more likely to have poor QoL and mental health.[22] There was a positive association of years of experience with QoL scores in psychological, relation and environment domains. A study from Iran among health care workers however reported lower scores in all four domains were associated with experience.[20] On the other hand a study from Italy showed that social and emotional domain scores were higher among experienced HCWs compared to less experienced.[26] These variations in the QoL with experience could be due to varying privileges and responsibilities associated with increasing work experience.

This study is one of its kinds to assess the QoL of HCWs amid COVID-19 pandemic. We used a validated WHO QoL BREF tool for the assessment of the QoL of health care workers. There are certain limitations which need to be considered while interpreting results of this study. This was online survey where response rate could not be ascertained. However, given the COVID-19 pandemic and social distancing measures, this was most suitable approach to reach the study population. QoL of life can be affected by many other factors within and outside workplace. We included many of the important confounders in our study. However due to online nature of study, we did not include other variables such as job satisfaction, job security and stress full events in the recent past.

CONCLUSIONS

Quality of life of the health care workers has been negatively affected by COVID-19. This calls for hospitals administrations, policymakers and governments to take necessary intervention to protect the mental and physical wellbeing of the backbone of health care system. Specific interventions such improving hospital conditions, incentives, professional training and psychological counselling can help improve the wellbeing and productivity of HCWs.

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AUTHORS' CONTRIBUTIONS

NH, FSL and UR conceived the idea, and developed the research methods and tools. SA, SA and MM collected data. NH and FSL conducted data analysis. NH, SA, FSL wrote the draft. UR reviewed and edited the final draft. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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